

The Angiosperm Flora of Singapore Part 3

PLANTAGINACEAE

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Plantago L.

Sp. pl. (1753) 112; Gen. pl. ed. 5 (1754) 52; Ridl., J. Straits Br. R. Asiat. Soc. 33 (1900) 125; Ridl., Fl. Malay Penins. 2 (1923) 225; M.R. Hend., Malayan Wild Flowers, Dicotyledons (1959) 268; H. Keng, Gdns' Bull., Singapore 36 (1983) 111; H. Keng, Concise Flora of Singapore (1990) 140; I.M. Turner, K.S. Chua & H.T.W. Tan., Journal of the Singapore National Academy of Science 18 & 19 (1990) 80; I.M. Turner, Gdns' Bull., Singapore 45 (1993) 189.

Annual or perennial herbs, rarely small shrubs. *Leaves* simple; usually spirally arranged; lamina venation parallel, margin entire or toothed; petiole forming a sheath at the base; exstipulate. *Inflorescence* spicate or capitate; axillary; pedunculate; bracts persistent. *Flowers* 4-merous; unisexual or bisexual; regular; calyx lobed or deeply cleft; corolla scarious, lobes imbricate in bud; stamens as many as and alternating with corolla lobes, filaments long, anthers 2-loculate, exserted, versatile, opening by longitudinal slits; ovary single, superior, usually 2-loculate, placentation axile, ovules, with an integument several cells thick, 1 to many per locule; style 1, bifid. *Fruit* a circumscissile capsule, dehiscing transversally with the top segment falling off as a lid. *Seeds*, with a translucent testa, 1 or more per locule; endospermous.

Distribution - The genus *Plantago*, with about 250 species (Mabberley, 1990), is naturally distributed in Europe and temperate Asia. According to Holm *et al.* (1977), the widespread introduction of *P. major* and *P. lanceolata*, to various parts of the world has resulted in the almost cosmopolitan distribution of the genus; both species are found in all continents, except the Antarctic and Arctic. Man has played a prominent role in the widespread distribution of this genus. Only *Plantago major* occurs in Singapore.

Ecology - Mostly weeds of disturbed areas such as agricultural land, wasteland, cultivated ground, roadsides, and open fields. Allard (1965) regarded *P. lanceolata* as one of the 12 most successful naturally growing

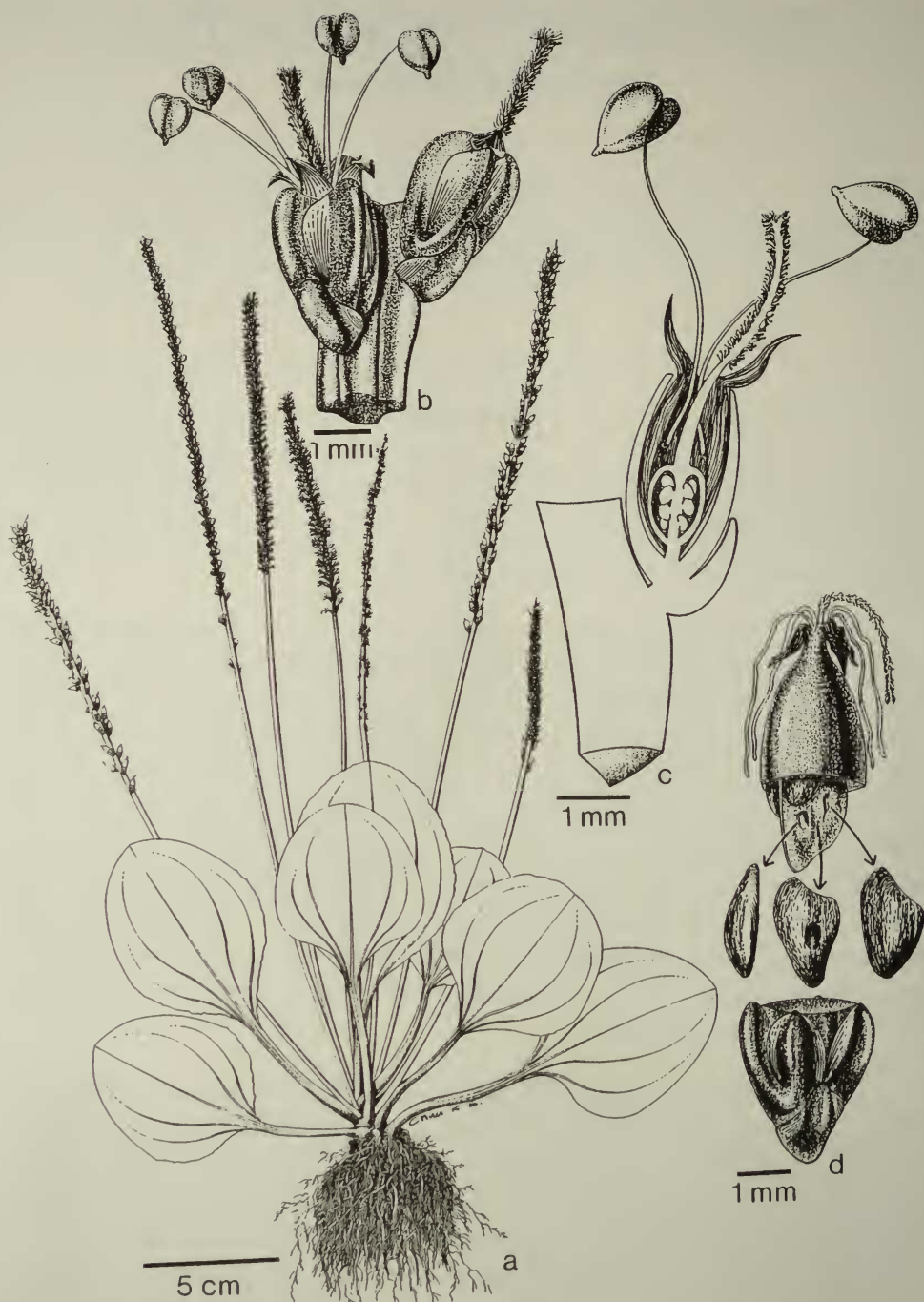


Fig. 1: *Plantago major* L. a. Habit. b. A segment of the inflorescence showing a flower and a flowering bud. c. Longitudinal section of flower. d. 'Exploded' view of the circumscissile capsule. [K. S. Chua 413]

colonizing plants. *P. major* and *P. lanceolata* are among the world's most noxious weeds (Holm *et al.*, 1977).

Uses - When soaked in water, the seeds of some species produce copious mucilage which are medicinal (Burkill, 1966). The testa ('husk') of several species, notably *P. ovata*, *P. psyllium* and *P. indica*, are prepared by the pharmaceutical industry and widely used as a bulk laxative (Leung, 1980) and remedy for chronic diarrhoea. The husk mucilage is also used as a thickener in some food products.

1. *Plantago major* L.,

Sp. pl. (1753) 112; Ridl., J. Straits Br. R. Asiat. Soc. 33 (1900) 125; Ridl., Fl. Malay Penins. 2 (1923) 225-226; M.R. Hend., Malayan Wild Flowers, Dicotyledons (1959) 268; H. Keng, Gdns' Bull., Singapore 36 (1983) 111; H. Keng, Concise Flora of Singapore (1990) 140; I.M. Turner, K.S. Chua & H.T.W. Tan, J. Singapore Nat. Acad. Sci. 18 & 19 (1990) 80; I.M. Turner, Gdns' Bull., Singapore 45 (1993) 189.

P. asiatica L.

Perennial herb. *Leaves* simple; in a radical rosette; lamina broadly ovate to narrowly lanceolate, 3-22 by 1-22 cm, with 5-9 longitudinal veins, glabrous or pubescent, apex rounded, obtuse or acute, margin entire, shallowly or deeply toothed, base abruptly narrowed; petiole 1-25 cm long. *Inflorescence* an upright spike, 10-30 cm long; peduncle 4-50 cm long, terete or shallowly ribbed, glabrous or pubescent; bracts 1-3.25 mm long. *Flowers* greenish-white, bisexual; calyx lobes oval, oblong, obtuse or acute, 1.25-2 mm long, margin scarious; corolla lobes spreading, 1-1.5 mm long; style 4-6 mm long. *Fruit* ovoid, 3-4 mm long. Seeds brown or black, oblong, 1 by 0.75 mm, rugose, 4-21 per locule.

Distribution - Singapore: widely distributed and locally common; Nee Soon Swamp Forest, Kent Ridge, Dover Crescent, Punggol, Tanglin, etc.

Ecology - *P. major* can be found as a naturalized weed in disturbed areas such as wasteland, public car parks, gardens and lawns. The plant is remarkable in its ability to adapt to a wide range of growing conditions. In Singapore, *P. major* can be found growing in periodically-mown lawns, in waterlogged areas beside drains, and in cracks in concrete pavements. In Europe and Morocco, *P. major* has been found growing in regions of 2,000 metres a.s.l. Its most northerly location is Spitsbergen, a Norwegian island at latitude 77 °N (Sagar and Harper, 1964). The wide distribution of the plant has led Holm *et al.* (1977) to suggest that its "habitat is probably not restricted by climate." Being of temperate origin, the plant's adaptability and tolerance to adverse growing conditions are severely tested in the low altitude and equatorial climate of Singapore. Holm *et al.* (1977) mentioned

that *P. major* is rarely a troublesome weed in the equator as the tropical heat and competition from the taller and more vigorous-growing plants help to keep *P. major* under control. The mature plants of *P. major* flower and fruit frequently throughout the year. Ridley (1930) noted that the seeds are wind-dispersed.

Uses - According to Burkill (1966), *P. major* was originally introduced from China for use as a medicine for diarrhoea and dysentery and for the seeds in making jelly, while the leaves are occasionally eaten as a vegetable. He also added that the Malays use the plant in the treatment of cough, dysentery and gonorrhea.

Notes - *P. major* is extremely variable in form. Backer (1965) stated that "they might be taken for different species, were it not that they are connected by series of intergrades." For a key to the numerous varieties and taxa of *Plantago major*, see Pilger (1937).

Acknowledgements

This project was supported by The National University of Singapore Research Grants RP 880301 and RP 930325.

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